

## CLAIMS

- 1 1. A method for diagnosing faults in a system under test (SUT), the SUT defining  
2 data transmission paths through which data are transferred, said method comprising:  
3 identifying at least some portions of the data transmission paths of the SUT  
4 capable of introducing errors in data transfer;  
5 providing constraints defining relationships of at least some of the portions of  
6 the data transmission paths identified; and  
7 diagnosing the SUT with respect to the constraints.
- 1 2. The method of claim 1, wherein identifying comprises providing a dataflow  
2 model corresponding to the SUT, the dataflow model including edges, each of which  
3 corresponds to a portion of one of the data transmission paths of the SUT capable of  
4 introducing errors in data transfer.
- 1 3. The method of claim 2, wherein the dataflow model includes vertices, each of  
2 the edges being defined between two of the vertices.
- 1 4. The method of claim 3, wherein each of the vertices is at least one of a  
2 termination of an edge and representative of a location where an operation with  
3 respect to data can occur.
- 1 5. The method of claim 4, wherein the operation corresponding to a vertex  
2 includes at least one of dropping data, splitting data, routing data, replicating data and  
3 combining data.

- 1 6. The method of claim 4, further comprising:  
2 receiving test results corresponding to the SUT; and  
3 wherein diagnosing comprises analyzing the test results with respect to the  
4 dataflow model.
- 1 7. The method of claim 6, wherein the SUT includes counters corresponding to  
2 at least some of the edges of the dataflow model; and  
3 further comprising:  
4 receiving information, corresponding to the test results, from at least some of  
5 the counters.
- 1 8. The method of claim 6, wherein the dataflow model is a directed graph.
- 1 9. The method of claim 6, wherein analyzing the test results comprises:  
2 receiving information corresponding to failed data transfers; and  
3 identifying portions of the SUT potentially associated with the failed data  
4 transfers.
- 1 10. The method of claim 9, wherein analyzing the test results comprises:  
2 exonerating portions of the SUT initially identified as being associated with  
3 the failed data transfers if those portions of the SUT are determined not to have  
4 initiated at least one of the failed data transfers.

1 11. The method of claim 1, wherein diagnosing the SUT comprises:

2 receiving information regarding data transfers with respect to the  
3 portions identified, the information being obtained via cyclic redundancy checking.

1 12. The method of claim 1, wherein identifying comprises providing a dataflow  
2 model corresponding to the SUT, the dataflow model including edges and vertices,  
3 each of the edges corresponding to a portion of one of the data transmission paths of  
4 the SUT capable of introducing errors in data transfer, each of the edges being defined  
5 between two of the vertices; and

6 wherein the constraints correspond to data flow characteristics of the SUT  
7 exhibited with respect to the vertices.

1 13. The method of claim 12, wherein at least one of the constraints of at least one  
2 of the vertices relates that an amount of data flowing into the vertex corresponds to an  
3 amount of data flowing from the vertex.

1 14. The method of claim 13, wherein the amount of data flowing into the vertex  
2 corresponds to an amount of at least one of: good data, bad data and a particular type  
3 of data flowing into the vertex.

1 15. A method for diagnosing faults in a system under test (SUT), said method  
2 comprising:  
3 providing a dataflow model representative of the SUT, the dataflow model  
4 including information corresponding to a relationship of error detection capabilities of  
5 the SUT; and  
6 diagnosing the SUT with respect to the dataflow model.

1 16. The method of claim 15, wherein diagnosing the SUT comprises:  
2 providing constraints defining relationships of at least some of the portions of  
3 the dataflow model.

1 17. The method of claim 15, wherein diagnosing the SUT comprises:  
2 generating information indicative of a manner of failure of the SUT.

1 18. The method of claim 17, wherein the flow of data is a flow of data packets;  
2 and  
3 wherein diagnosing the SUT further comprises:  
4 analyzing information acquired via cyclic redundancy checks  
5 performed at various locations associated with the flow of data.

1 19. The method of claim 15, wherein the dataflow model lacks procedural content  
2 and process calls.

1 20. A system for diagnosing faults in a system under test (SUT), said system  
 2 comprising:  
 3 a dataflow model representative of error detection capabilities of the SUT; and  
 4 a reasoning engine associated with said dataflow model, said reasoning engine  
 5 being adapted to evaluate test results corresponding to the SUT in relation to said  
 6 dataflow model.

1 21. The system of claim 19, wherein said dataflow model is a directed graph  
 2 including edges and vertices, each of said edges corresponding to at least a portion of  
 3 a data transmission path of the SUT through which an error can be introduced, each of  
 4 said edges being defined by two of said vertices.

1 22. The system of claim 19, wherein said reasoning engine is adapted to evaluate  
 2 the test results of the SUT with respect to constraints, the constraints defining  
 3 relationships of at least some of the portions of the dataflow model.

1 23. The system of claim 19, wherein said reasoning engine is adapted to receive  
 2 information corresponding to failed data transfers and identify portions of the SUT  
 3 potentially associated with the failed data transfers.

1 24. The system of claim 19, further comprising:  
 2 an SUT communicatively coupled to at least one of said dataflow model and  
 3 said reasoning engine.

1 25. A system for diagnosing faults in a system under test (SUT), said system  
 2 comprising:  
 3 means for receiving test results corresponding at least some portions of data  
 4 transmission paths of the SUT; and  
 5 means for diagnosing the SUT with respect to constraints defining  
 6 relationships of at least some of the portions of data transmission paths of the SUT.

1 26. The system of claim 25, wherein said means for diagnosing includes means for  
 2 analyzing the SUT with respect to a dataflow model.

1 27. The system of claim 25, further comprising:  
 2 means for testing the SUT to generate test results.

1 28. A diagnosis system stored on a computer-readable medium, the diagnosis  
 2 system being adapted to diagnose faults in a system under test (SUT), said diagnosis  
 3 system comprising:  
 4 logic configured to identify at least some portions of the data transmission  
 5 paths of the SUT capable of introducing errors in data transfer;  
 6 logic configured to provide constraints defining relationships of at least some  
 7 of the portions of the data transmission paths; and  
 8 logic configured to diagnose the SUT with respect to the constraints.

1 29. The diagnosis system of claim 28, wherein said logic configured to diagnose  
2 comprises:

3 logic configured to provide a dataflow model; and

4 logic configured to analyze the SUT with respect to a dataflow model.

1 30. The diagnosis system of claim 28, wherein said logic configured to diagnose  
2 includes logic configured to generate information indicative of the flow of data  
3 associated with a time of error detection.

1 31. The diagnosis system of claim 28, wherein said logic configured to diagnose  
2 includes logic configured to identify portions of the SUT potentially associated with  
3 failed data transfers.

1 32. The diagnosis system of claim 31, wherein said logic configured to diagnose  
2 includes logic configured to exonerate components initially identified as being  
3 associated with the failed data transfers.